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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | February 19, 2010 | Modified ‘Related Sections’ |
| 3 | March 15, 2011 | Minor changes from Legal reviews |
| 4 | June 25, 2013 | Final Draft – Consolidated Comments Spec Update Project |
| 5 | June 25, 2013 | Incorporation of new Commissioning and Computerized Maintenance Management System Data Requirements Specification cross references. |
| 6 | August 5, 2014 | Changes to reflect renaming of commissioning specification and final review (AV) |
| **7** | **February 4, 2015** | **Updated, Finalized Specification – Reference eDOCS #5630509 v9 (AV)** |
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NOTE:

This is a CONTROLLED Document. Any documents appearing in paper form are not controlled and should be checked against the on-line file version prior to use.

**Notice:** This Document hardcopy must be used for reference purpose only.

**The on-line copy is the current version of the document.**

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## Related Sections

### [Under "Related Sections", identify other Sections that are related to, and/or dependent on, the work results or information specified elsewhere. The list should be limited to Sections with specific information that the reader might expect to find in this Section, but is specified elsewhere. For example, if hardware for aluminum entrances is specified in the aluminum entrance Section, a cross-reference would be appropriate in the finish hardware Section. The purpose of this cross-referencing is for information only, to aid in finding those other requirements—not to define the scope of the Section.

### Cross-referencing here may also be used to coordinate assemblies or systems whose components may span multiple Sections and which must meet certain performance requirements as an assembly or system.

### Contractor is responsible for coordination of the Work. Contractor is responsible for being familiar with and incorporating all required elements of cross-referenced Specifications cited.

### This Section is to be completed/updated during the design development by the Consultant. If it is not applicable to the section for the specific project it may be deleted.]

### [List Sections specifying installation of products supplied but not installed under this Section and indicate specific items.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Execution requirements for ...[item]... specified under this Section.

### [List Sections specifying products installed but not supplied under this Section and indicate specific items.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Product requirements for ...[item]... for installation under this Section.

### [List Sections specifying related requirements.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: [Optional short phrase indicating relationship].

#### Section 01250 – Substitutions

#### Section 01425 – Computerized Maintenance Management System Data Requirements

#### Section 01810 – Equipment Testing and Facility Commissioning

#### Section 16010 – Electrical General Requirements

#### [Division 13 – SCADA and Instrumentation – insert applicable specifications]

#### Product requirements for [item]... for installation under this Section

## References

### American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE)

#### Air circuit breaker in accordance with ANSI/IEEE C37.13-2008, IEEE Standard for Low-Voltage AC Power Circuit Breakers Used in Enclosures, as amended by IEEE C37.13a-2012, IEEE Standard for Low-Voltage AC Power Circuit Breakers Used in Enclosures Amendment 1: Increase of Voltages to 1000 V AC and Below.

#### IEEE Standard 1015-2006, IEEE Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.

### Canadian Standards Association (CSA)

#### C22.2 NO. 5-13, Molded-case circuit breakers, molded-case switches and circuit-breaker enclosures (Tri-national standard, with UL 489 and NMX-J-266-ANCE-2013).

## Measurement and Payment

*[Choose one of the following payment language provisions that best suits the individual project.*

*If this Section is not specifically referenced by an item in the Bid Form, please use the following language:*

### The work of this Section will not be measured separately for payment. All costs associated with the work of this Section shall be included in the Contract Price.

*OR If this Section is specifically referenced in the Bid Form, use the following language and identify the relevant item in the Bid Form:*

### All costs associated with the work of this Section shall be included in the price(s) for Item No(s). \_\_\_ in the Bid Form.

*If the work of this Section is to be measured and paid for by several different methods, please amend the standard wording given above to reflect the different methods of measurement and payment.*]

## Product Data

### Submit Product data in accordance with Section 01300 – Submittals.

### Equipment shall be in accordance with Section 16010 – Electrical General Requirements.

### Include time-current characteristic curves for breakers with interrupting capacity of 22,000 A symmetrical (rms) and over at system voltage.

### Submit all other required information as detailed in the equipment information template in an electronic format suitable for upload to the Region’s CMMS (Maximo) and in accordance with Section 01430 – Operation and Maintenance Data and Section 01425 - Computerized Maintenance Management System Data Requirements.

## Field Quality Control

### Perform tests in accordance with Section 16031 – Inspection and Testing, Section 16010 – Electrical General Requirements and Section 01810 – Equipment Testing and Facility Commissioning.

### Check factory made connections for mechanical security and electrical continuity.

### Check trip unit settings and to ensure proper working operation and protection of the components.

# PRODUCTS

## Breakers General

### Bolt-on Moulded Case Circuit Breaker: Quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40°C ambient.

### Plug-in Moulded Case Circuit Breakers: Quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40°C ambient.

### Common-trip Breakers: With single handle for multi-pole applications.

### Magnetic instantaneous trip elements in circuit breakers shall operate only when the value of current reaches setting. Trip settings on breakers with adjustable trips shall range from [3 to 8] times the current rating.

### Circuit breakers with interchangeable trips as indicated in the Contract Documents.

### NEMA rated equipment only. [EEMAC standards are outdated but may be considered if there are no current equivalent applicable standards available. If EEMAC standards are to be applied, the Consultant will review the standards and replace with an equivalent NEMA standard]

## Thermal Magnetic Breakers [Design A]

### Moulded case circuit breaker shall operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

## Magnetic Breaker [Design B]

### Moulded case circuit breaker shall operate automatically by means of magnetic tripping devices to provide instantaneous tripping for short circuit protection.

## Fused Thermal Magnetic Breakers [Design C]

### [Where the available short circuit currents exceed the rating of standard thermal magnetic breakers range, the Contractor shall propose suitably rated (and approved by the Consultant) fused breakers suitable for the short circuit currents found. Adhere to the recommendations of the fuse and breaker manufacturers applicable to the conditions. Use magnetic breakers only when short circuit protection only is required. Consultant to approve Contractor proposed fused breakers for any deviations from the Contract Documents]

### Fused thermal magnetic breakers with current limiting fuses internally mounted. Time current limiting characteristics of fuses coordinated with time current tripping characteristics of circuit breaker. Coordination shall result in interruption by breaker of fault-level currents up to interrupting capacity of breaker. Fuses individually removable and interlocked with breaker. The removal of a fuse cover, blowing of a fuse or removal of a fuse, shall trip the breaker.

## Solid State Trip Breakers [Design D]

### Moulded case circuit breaker shall operate by means of a solid-state trip unit with associated current monitors and self-powered shunt trip to provide inverse time current trip under overload condition, and long time, short time, instantaneous tripping for phase, ground fault short circuit protection.

## Enclosure

### Mounted in NEMA 1 type enclosure, sprinkler proof as indicated in the Contract Documents or *[Consultant to specify enclosure for individually mounted breakers.]*

# EXECUTION

## Installation

### Install circuit breakers as indicated on the Contract Drawings.

### For component and system commissioning activities refer to Section 01810 – Equipment Testing and Facility Commissioning. It is recognized that overall system commissioning activities highly depend on properly functioning and fully documented components as detailed in this Section.

## Commissioning

### For all commissioning activities on systems where components of this Section are integral to functionality, refer to Section 01810 – Equipment Testing and Facility Commissioning. All inspection and testing activities shall be completed in accordance with the commissioning plan that shall be provided to the Consultant prior to the commencement of commissioning activities.

**END OF SECTION**